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Electric Light & Power

THE NEWS MAGAZINE OF ELECTRIC UTILITY MANAGEMENT AND TECHNOLOGY

PaPUC approves GPU rate settlement

TMI-1 restart problems menace viability of agreement

Dan Utroska
Associate Editor

In an attempt to demonstrate that Pennslyvania Governor Richard Thornburgh's plan for the cleanup of Three Mile Island is working, and to financially support General Public Utilities through another potentially troublesome year, the Pennsylvania Public Utility Commission has approved a negotiated settlement that could result in aggregate base rate increases of $187.2 million.

The negotiated settlement, which was hammered out by the PUC staff, GPU's Pennsylvania subsidiaries, and the Office of the State Consumer Advocate, was approved by the full commission on January 8 by a vote of 4-0, with Commissioner Michael Johnson disqualifying himself. The settlement is a complex arrangement that provides for a series of base rate increases for GPU's Pennsylvania subsidiaries.

The first increase is to become effective almost immediately after PUC authorization of the proposal, the second increase is to be initiated upon TMI-1 restart, and the third increase is implemented when the companies' deferred energy balance (a surcharge currently being assessed GPU ratepayers in Pennsylvania) is exhausted. One important provision of the settlement is that the revenues from the $25 million and $12.5 million base rate increases that will be granted to Metropolitan Edison and Pennsylvania Electric Company, respectively, upon TMI-1 restart will be escrowed for TMI-2 decontamination.

Notwithstanding the ballyhoo surrounding publicity last fall that President Reagan was going to provide over $100 million for cleanup, and which ultimately turned out to be research and development money that had little direct impact on decontamination (see *EL&P*, December, 1981, page 20), the parties in Pennsylvania say they are optimistic that this evidence of ratepayer contributions will stimulate federal support.

Congressman Allen E. Ertel, however, and others, are noticeably less sanguine. Last October Ertel sent a letter to President Reagan asking point blank, "Does your administration intend to provide $190 million in cleanup offset costs?" (Governor Thornburgh had outlined in his cleanup plan that $190 million would be required from both the federal government and from the electric utility industry.) According to Ertel spokesman Bill Brobst, the congressman has yet to hear from the President. "We wonder about the seriousness of the administration's commitment," Brobst said.

For its part, the Edison Electric Institute has conceded that voluntary contributions to TMI-2 cleanup were not likely to flow either from the nuclear industry or from the electric utility industry as a whole. The institute is therefore seeking legislation to mandate such participation.

GPU taxes due again

Last year, as GPU neared its April tax date, it was not at all clear where the $23 million would come from for

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Chinese officials host Americans

Electric utility executives participating in a People-to-People visit to the People's Republic of China were recently hosted by Ministry of Power officials. Deputy Vice Minister Su is second from left. See the Foreign Power report beginning on pages 10 & 11.

Demand, not regulations, is cause

Shearon Harris units 3 & 4, Hope Creek-2 cancelled

BARRINGTON, IL — Carolina Power & Light Company has announced that it has cancelled plans to construct units 3 and 4 of its Shearon Harris nuclear generating station and Public Service Electric and Gas Company has similarly announced that it will abandon its Hope Creek-2 generating plant.

The cancellations, which came late last year, add to the growing list of terminated nuclear plants, which recently include Boston Edison's Pilgrim-2 plant (in September), Northern Indiana Public Service Company's Bailly plant (in August), and Union Electric Company's Callaway-2 plant (in October).

What is noteworthy about the Shearon Harris and Hope Creek cancellation announcements, both of which were issued in December, 1981, is that no mention is made of regulatory problems as major contributors to the cancellations.

CP&L chairman and president Sherwood H. Smith, Jr. said the company recommended the cancellation of the Harris plants based on expectations that an expanded conservation and load management program can reduce the company's electrical generating requirement by 1,750 megawatts over the period 1982 through 1995. This would be about equal to the output of the two 900-megawatt Harris units.

"The decision was based on studies which show that with the cooperation

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Banks protest Initiative 394; file court suit

RICHLAND, WASH.— Three large banks which have appreciable holdings of bonds issued by the Washington Public Power Supply System have filed suit in federal court challenging Initiative 394 that was passed by area voters late last year.

The initiative, which passed by a margin of 58 percent, was consumer response to the skyrocketing costs of the supply system's large nuclear construction program. The initiative requires that beginning July 1, 1982, any and all new bond issues by WPPSS for nuclear construction have to be submitted to voters for approval.

The banks filing suit in late December were the Seattle First National Bank, the Continental Illinois National Bank & Trust Co. of Chicago, and the Morgan Guarantee Trust of New York. The suit, which was filed in the U.S. District Court in Spokane, charges that the initiative violates the U.S. Constitution and the Washington State Constitution. According to a WPPSS spokesman, it alleges that these documents guarantee the ability of citizens to enter into contracts and obligations which the initiative impairs. Outstanding bonds were sold and purchased on the presumption that no public votes would be required to complete current nuclear projects and pay off the bondholders.

In addition, issues are raised under the Fourteenth Amendment of the U.S. Constitution regarding "equal protection of the law." The initiative creates a "peculiar voting situation" in which some Washington area citizens who have an interest in the WPPSS plants are prohibited from voting on future bond issues if they happen to live outside of the 23 public utility districts and cities that are supply system members. The WPPSS

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Some fuel regs eased; other revisions pending

WASHINGTON, D.C. — Electric utilities and industrial firms will now be able to petition for exemptions to the "off-gas" provisions of 1978 Powerplant and Industrial Fuel Use Act by self-certifying their eligibility rather than supplying evidence to the Department of Energy that they are qualified.

The relaxation of the rules has been finalized for a number of provisions in the act and still others are being contemplated.

The fuel use act (FUA) was passed by Congress at a time when natural gas supplies were seen to be dwindling and it was envisioned that quantities could be extended if natural gas or oil use by new powerplants and large industrial boilers was prohibited. The act was aimed at encouraging the switch to coal or other alternative fuels with the goal of saving natural gas for "high priority" uses.

The act, however, met with stiff opposition from the electric utility industry, which maintained that it was financially impossible for gas-dependent electric companies to convert large portions of their generating capability. The industry said its generation plans already called for the replacement of natural gas, but on a more gradual schedule than the one outlined in the act (by 1990). The in-

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Stop sniping at regulators, NRC's Gilinsky warns industry

Commissioner sees regulation protecting utility investments

BETHESDA, MD. — In a toughly worded message to nuclear industry representatives here, Nuclear Regulatory Commissioner Victor Gilinsky has vigorously denounced assertions by the Reagan Administration and the utility industry that nuclear regulations cause licensing delays and economic uncertainty.

"I wish I could find a way to convince you, especially those of you representing utilities, that blaming the regulators for all your ills is not a very smart tactic and will ultimately backfire on you," Gilinsky told the Washington section of the American Nuclear Society.

Gilinsky was responding to one sentence in the president's recent nuclear policy statement that the industry had highlighted in a full-page advertisement in the *Washington Post*. The statement reads, "Nuclear power has become entangled in a morass of regulations that do not (sic) enhance safety but that do (sic) cause extensive licensing delays and economic uncertainty." Referring to this statement and the nuclear industry's use of it, Gilinsky warned that "industry lobbyists can't escape responsibility for this attack on the safety regulators."

"The public may not trust us very much," Gilinsky said, "but they don't trust you at all. When the average person hears from you and the administration that the safety regulators don't know what they are doing, he doesn't conclude that the industry and the Department of Energy are right and the NRC is wrong. He concludes that nuclear energy is even more dangerous than he thought."

Declaring that Wall Street has warned that another Three Mile Island accident would signal the end of nuclear power in the United States, Gilinsky began to recite the litany of recent quality assurance problems that have cropped up during construction of nuclear plants such as Marble Hill, South Texas, and Zimmer.

With respect to operating plants, the NRC regulator said he had recently visited a plant that had been "saved from itself by NRC's firm action in imposing a strict remedial regime on the operation."

"So I ask you," Gilinsky said, "can you really be confident that all of these electric utilities are going to build their plants and manage their operation carefully without NRC supervision? Are you really ready to put your commercial future in the hands, not of the average performer, but in the hands of the *worst* performer?"

There are a lot of real problems swirling around the construction and operation of nuclear plants in America, Gilinsky said, noting that "some utilities are in over their heads." He warned that in the areas of construction and operation some utilities have lost control of their projects and have had to be reined in by the NRC.

"Who but the NRC is there to maintain a minimum standard," Gilinsky asked. "Do you really think the industry can regulate itself? I don't. Irritating as it may be, NRC performs a badly needed service, not just for the public but for the industry as well. We help keep your plants safe and thus help protect the enormous investment they represent."

And rather than giving the industry any hope that the NRC will be easing regulations, Gilinsky provided his listeners with unambiguous statements that, if anything, future enforcement will be swifter and more severe. "I think...that we are going to get tougher and you'll be making a big mistake if you fight this," Gilinsky said. "Do you really want us to ease off on the weakest of your fellow utilities? If that happens, the whole industry will end up sharing their mistakes."

Referring to the *Washington Post* advertisement, Gilinsky said that it had suggested that 33 plants could be made ready to operate in the next two years if regulators would only stop dragging their feet. "I've examined these projects," Gilinsky countered. "On the basis of our experience with nuclear construction schedules, I would guess that not more than 20 of the 33 will actually be completed by then. I'm talking about construction delays and not licensing delays."

'An Invitation'

"I wonder whether we could not put an end to this way of dealing with each other," Gilinsky concluded. "So far as I can see, it's just not in the cards for the nuclear enterprise to grow much beyond the number of current firm projects. There is no point in trying to balloon that number or to argue about where all those earlier rosy forecasts went. It's mostly the work of Adam Smith. Let's try to make sure that the reactors we are building and operating are built right and work right. NRC is an essential element. It can only do *its* job if the industry and the administration work with it, not against it."

Nuclear cancellations . . . from page 1

of our customers we can cancel these units and still meet the electrical demands of this growing region, and do this more economically than we would by completing the units," Smith said.

The Shearon Harris units were both less than 1 percent complete when the decision was made to cancel.

A lower than anticipated growth in electricity demand was also cited as a reason for cancelling the Hope Creek plant. In addition, PSE&G said it terminated that unit because of the financial burden of raising the necessary capital for construction and uncertainties as to anticipated fuel savings to offset the additional capital costs due to factors beyond the company's control. Such uncertainties were said to include future oil and coal prices, the rate of inflation, the cost of capital, electric load growth in the 1980's and 1990's, and future federal and state regulation.

"The decision (to cancel) was based largely on today's economic realities," Robert I. Smith, PSE&G chairman said. "Conservation and low electric load growth have reduced the need for new capacity in the future."

Construction of the Hope Creek unit, which had been scheduled for operation in 1989, was about 18 percent complete when terminated. Hope Creek-1 will continue as planned and in early January, 1982, the plant was nearly 40 percent complete. Planned operation is for 1986.

Recovery sought

Both CP&L and PSE&G said they would seek to recover through rates the investment they have made so far in their respective cancelled plants.

CP&L's Smith said the company will request from appropriate regulatory commissions permission to amortize the $187 million investment in Harris units 3 and 4 over a 10-year period. CP&L calculates that collecting the cancellation costs through rates will result in a lower bill to customers than if the company had continued with construction of the two plants.

"Since the investment was made for the benefit of customers, and the decision to cancel has been made to the benefit of customers, collecting the cost of this investment through rates is fair and reasonable and will be requested in our next rate filing," Smith said.

PSE&G said that it has been in discussions with the New Jersey Public Advocate's office and that they have worked out an agreement which would provide for treatment of abandonment costs. The proposed agreement has been submitted to the New Jersey Board of Public Utilities for approval.

The agreement calls for the company to recover abandonment costs estimated at $172 million, after tax reductions, beginning July 1, 1982. The amortization, if authorized, would extend over about 14 years, PSE&G said.

Because of the reduced demand forecast at CP&L—2.9 percent annually through 1990 compared with 3.3 percent of 1 year ago—the company said it would also delay unit 2 of its Harris station. The in-service date will be moved from 1988 to 1989. The first unit will stay on schedule, with a projected startup date of 1985.

CP&L also said that it would delay by 1 year the startup of its Mayo-2 coal generating unit. It is now scheduled for 1991 operation.

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A system-wide cogeneration scheme featuring coalgas fuel combined-cycle generating plants is being considered by Arkansas Power & Light. **E/G** 25

The first large-scale coal gasification facility linked to a utility power plant is currently under construction at Illinois Power and is scheduled to start operating early next year. **E/G** 37

Stone & Webster describes how it handled a tricky construction problem at the River Bend nuclear project. **E/G** 40

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Initiative 394 . . .

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spokesman explained that the City of Seattle, for example, although it has no interest in nuclear units 4 and 5, is qualified under the initiative to vote on future WPPSS bond issues.

WPPSS director on initiative

In a statement issued after the initiative had passed, WPPSS managing director Robert Ferguson expressed disappointment in the outcome but said he was a firm believer in the democratic process. "In this election, I believe the voters were not so much voting for the right to hold bond elections as they were voting against the cost increases of building these plants," he said.

"It is regrettable that the WNP 4/5 crisis of September and October diverted the attention and energies of most our member utilities from this important issue and that the people of Washington were not properly presented with the many sensible arguments against the initiative."

Bond issue planned

Because the initiative does not become effective until July 1, 1982, the supply system may go to the bond market before that time as the need arises. According to John Tamangi, of Lazard Freres and Co. (the supply system's financial advisor) WPPSS will continue to have very good access to the market place in the future for sales for nuclear units 1, 2, and 3.

A company spokesman said that a bond sale was being planned for the month of February. The supply system has calculated that it would run out of funding for units 1 and 2 construction by March 1 and that although the dollar figure of the proposed bond issue had not been precisely determined at press time, it was expected that the February sale would be of the order of $500 million.

AP&L sees 'window of opportunity' to double revenue via congeneration

Arkansas Power & Light has found a way to almost double its revenue by 1985 through selling cogenerated process steam to industrial customers. "It offers an opportunity to get out of the electricity business and into the manufactured energy business," Wieble Alley, manager of energy applications for the utility company, told the Coal Technology Conference in Houston.

AP&L's electric revenue in 1980 was about $750 million. Alley estimated that the potential market value of process steam for 35 large industrial plants in AP&L's service area will be $500 million to $600 million in the 1985 to 1987 time frame.

The key to this opportunity — called the "greatest opportunity for the electric utility industry in many years" by Alley — is the approaching requirement for many industrial customers to do something about their fuel supply. The rising price and risky availability of imported oil has already led many industrial steam generators to look for an alternative. That, combined with the impending deregulation of natural gas, will create a "window of opportunity" for electric utilities to jump in and serve the market. The window will open for only a few years, Alley warned, and once it closes it will stay closed for a long time.

If industrial customers decide to buy and operate their own coal-fired steam-generating equipment, they will be committed for the next 30 years. However, Alley said he has surveyed the process heat requirements of industrial users and found a reluctance on their part to commit their capital to facilities that don't produce the product they sell. The electric utility, Alley added, is the natural developer, investor, owner, and operator of the new type of energy conversion and supply facilities needed to serve the energy market of the '80s and '90s.

Coalgas and combined cycles

The AP&L concept is based on a combination of combined cycle cogeneration and coal gasification. The cogenerating combined cycle, shown in the diagrams, is attractive because electricity output from the gas turbines can be decoupled from the process steam generated from the waste heat. A system designed to produce 4 pounds per hour of steam per kilowatt of electricity is much better suited to the market's needs than the conventional cogenerating boiler, Alley explained.

AP&L found 35 industrial customers in its service territory with process steam needs of about 6 million lbs per hour. Clusters of appropriately sized combined cycle plants could supply all this steam plus 1700 MW of electricity, Alley reported. A system owned and operated by the utility permits this electricity to be distributed through the grid, allowing much more flexibility than conventional cogeneration, he explained. He added that the primary product of the cogeneration plant would be the steam; electricity would be the by-product.

The combined cycle also provides "white elephant" insurance, according to the manager. If future market conditions change, the facility could easily convert to all-electricity production.

The problem with the combined cycle, Alley explained, is that it requires a clean fuel — a clean form of coal, in this case. AP&L explored the idea of indirect, fluid-bed air heaters but, said Alley, "The number of people who stepped forward to supply them was not encouraging."

Coalgas, he added, looks much better. There have been a number of studies of coalgas linked to combined cycles, and AP&L put together a conceptual design based on the Texaco gasification process. The output would be clean, medium Btu gas (in the range of 300 Btu per cubic foot) that could be piped as far as 200 miles, according to the utility's analysis. A central gasification installation could, therefore, serve a number of distant combined cycle/cogeneration installations. One combined cycle plant could provide steam for a cluster of adjacent or nearby industrial facilities, with the by-product electricity fed back to the AP&L system.

Another advantage of coalgas to AP&L is that it allows the system to reach the existing cogenerators. These 6 plants account for 60 percent of the total steam demand and currently produce 230 MW of electric power. (The overall system also retains the other candidates as AP&L customers because they might decide to generate their own electricity as well as their own process steam if they decided to go to coal on their own.)

The entire system, at full market penetration, would consist of an undetermined number of gasification plants producing a total of 460 billion Btu's per day. A pipeline system would carry the medium-Btu gas to the combined-cycle/cogenerating plants. These plants would produce 6 million lbs of process steam per hour for sale over the fence as their primary product. As a by-product, they would produce 1700 MW of electricity. The electrical production would be independent from the steam production because the gas turbines could be operated while the waste heat recovery boilers were shut down. The electrical production could be independent from the gasification system by keeping backup oil on site or by converting the coal to methanol, which could be stored on site.

Alley estimated that the total system would cost $5.2 billion, based on a four-year construction period ending in January, 1986. The gasification/pipeline system would account for 75 percent of the capital cost.

Two requirements for putting such a system into place are the ability to establish an unregulated subsidiary to own and operate it (the electricity production would have to remain regulated.) Alley said the utility would need partners for financing, but not

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FIGURE 1
INDUSTRIAL CUSTOMER REQUIREMENTS

Process steam	Purchases from AP&L	Present cogeneration (customer owned)	Potential new cogeneration (above present cogeneration)	
			AP&L owned	Customer owned
pph	kW	kW	kW	kW
1,100,000	0	80,000	290,000	0
950,000	12,060	20,000	315,000	12,000
800,000	6,760	30,000	300,000	0
375,000	8,808	20,000	100,000	0
364,000	22,599	10,000	95,800	16,250
250,000	40,067	72,000	62,500	25,000
250,000	12,774	–	62,500	8,800
240,400	1,941	–	60,000	8,000
200,000	1,274	–	50,000	7,000
200,000	6,486	–	50,000	7,000
120,000	5,344	–	30,000	3,000
100,000	1,371	–	25,000	4,000
100,000	5,252	–	25,000	4,000
100,000	6,184	–	25,000	4,000
89,000	2,936	–	22,250	2,225
80,000	5,262	–	20,000	2,000
75,000	1,917	–	18,750	1,875
70,000	2,631	–	17,500	2,000
70,000	2,984	–	17,500	1,750
70,000	1,588	–	17,500	1,750
55,000	4,113	–	13,750	1,375
50,000	2,900	–	12,500	1,250
45,000	3,644	–	11,250	1,125
45,000	844	–	11,250	1,000
35,000	5,895	–	8,750	921
35,000	1,638	–	8,750	700
35,000	3,256	–	8,750	820
28,000	2,089	–	7,000	560
25,000	2,483	–	6,250	500
22,850	461	–	5,700	457
20,000	4,240	–	5,000	465
12,000	1,961	–	3,000	290
10,000	432	–	2,500	200
9,500	562	–	2,375	190
9,500	995	–	2,370	200
6,040,250	193,751	232,000	1,713,495	120,641

FIGURE 2
CONVENTIONAL COGENERATION SYSTEM

Direct combustion steam topping system supplying 100,000 pph at 160 psig D & S at 80% annual load factor

1. Process steam to power ratio (25-50 lb/kW) depending on pressure differential between steam turbine throttle and process steam	Use 38 lb/kW
2. Heat charged to process steam	1350 Btu/lb
3. Heat charged to electric power 4200 - 5000	Use 4500 Btu/kWh
4. Annual fuel savings	
A. Fuel saving for cogenerated steam (100,000 x 1350) ÷ (100,000 x 1350)	0 Btu
B. Fuel saving for cogenerated electricity (100,000 ÷ 38) x (10,700 – 4500) x (8760 x .8)	114.4 x 10^9 Btu/yr

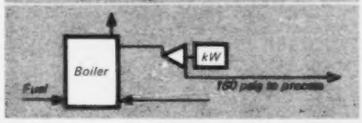


FIGURE 3
COMBINED CYCLE COGENERATION SYSTEM

Combined cycle—combustion and steam turbine supplying 100,000 pph at 160 psig D & S at 80% annual load factor

1. Process steam to power ratio—3-5 lb/kW	Use 4 lb/kW
2. Fuel input to produce 4 lb steam and 1 kW	10,400 Btu/hr
3. Fuel chargeable to power 10,400 – (4 x 1350)	5,000 Btu/kWh
4. Annual fuel saving using natural gas	
A. (100,000 ÷ 4) x (10,700 – 5,000) x (8760 x .8)	= 998.6 x 10^9 Btu/yr
5. Annual fuel savings using MBG from coal gasifier	
A. 25,000 kW x ((10,700 – (5000 ÷ .73)) x 7008 hrs	674.7 x 10^9 Btu/yr

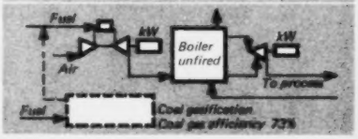


FIGURE 4
FUEL SAVING IMPROVEMENT THROUGH THE USE OF COMBINED CYCLE COGENERATION

	Electric cogenerated capacity kW per 100,000 ppph of process steam	Increased cogenerated electric capacity, %	Fuel saved by using cogeneration 10^9 Btu/yr	Increased fuel saving, %
Case II				
Conventional cogeneration	2,632	Base	114.4	Base
Case III				
Combined cycle cogeneration				
A. Natural gas	25,000	850	998.6	773
B. MBG	25,000	850	674.7	490
Case IV				
Combined cycle cogeneration in repowering configuration				
A. Natural gas	29,318	900	752.4	558
B. MBG	29,318	900	391.8	162

Furnace additive reduces air-heater plugging

KINCAID, IL — A fireside chemical additive injected in the upper furnace region of two 600-MW boilers at Commonwealth Edison's Kincaid station here has solved a nagging air heater fouling problem, reports plant technical engineer John Kennedy. In the 2 years the additive has been used there's been only one shutdown to wash out plugged air heater tubes. Before, Kennedy adds, shutdowns for washing were required 5 times a year.

Tube plugging

The tube plugging was traced back to sulfur trioxide condensation which led to ash agglomerating on the tubes. The two B&W cyclone boilers burn a Southern Illinois coal with from 3 to 5 percent sulfur, 11.5 to 12 percent ash, 8.2 to 10.7 percent moisture, and a heating value of 11,000 to 12,500 Btu per lb. The stack gas had SO_3 levels of 80 to 95 ppm and the acid dewpoint was 270 to 285F. The air heater metal temperature was below the acid dewpoint, Kennedy explains, which caused the plugging problem. The solution was periodic hydrojetting of the cold-section tubes because the pressure drop got as high as 17 in. of water (gage) through the air heater.

Inorganic additive

The chemical additive program was supplied by Dearborn Utilities Services Co. The material, a blend of inorganics (not MgO), is blown in through access ports cut in the tops of the furnaces. The material works by reducing the SO_3 concentration in the combustion gas through a combination of physical absorption and neutralization, explains a DUSCO spokesman. He says the Kincaid installation was one of the first large-scale applications for this new material.

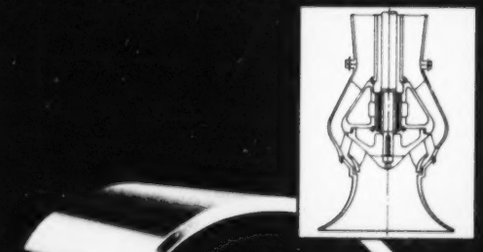
The additive feed rate varies from 50 lb/hr in the summer (when the higher gas temperature tends to be well above the acid dewpoint) to 300 to 350 lb/hr in the winter. The cold-end tube metal temperature is monitored, explains Com Ed's Kennedy, which is used as an additive feed rate indicator.

The result has been a reduction of SO_3 concentrations to the range of 5 to 8 ppm and reduced acid dewpoint temperature. Plugging has been virtually eliminated, says Kennedy. At a feed rate of about one lb per ton of coal (the units burn 260 TPH at full load each) the additive costs about 30 cents per ton of coal, a cost "definitely worth it," says Kennedy in view of the reduced downtime.

Side benefit

The additive program had a side benefit of reducing particulate emissions by improving the efficiency of the electrostatic precipitators. The SO_3 concentrations were so high in the stack gas that the fly ash resistivity fell below the optimum range for precipitator operation — resistivity was so low that fly ash was re-entraining. By reducing the SO_3 concentration, the additive program increased the fly ash resistivity, increased the precipitator efficiency, and reduced particulate emissions from 0.25 to 0.17 lb per million Btu. (New precipitators were installed at the station to meet a tightened requirement.)

This water lube bearing helps condenser pumps keep their cool.



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Coal-to-liquid pilot plant a success: DOE

WASHINGTON — The Department of Energy says the H-coal coal liquefaction pilot plant it sponsors in Catlettsburg, Kentucky is a success. The plant completed its first long production run in December, 1981 during which it operated for 131 days, 72 percent of the time at design rating of 220 tons of coal a day. The plant converted a total of 19,200 tons of coal to a low-sulfur liquid hydrocarbon which could be further refined to produce gasoline or heating oil.

The pilot unit, which is operated by Ashland Oil Co., is expected to be restarted this spring on Wyodak coal. DOE says that it will stop paying for operating the plant in October, 1982.

Cogeneration ...

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necessarily the steam customers. Financing could come from disinterested sources who could take advantage of AP&L's tax credits, for example, under the new tax law. The utility has also proposed changes in federal law that would shield a utility-owned cogeneration subsidiary from state regulation.

Feasibility studies are still underway and industrial prospects are still being courted, Alley told the Houston audience, adding, "this national resource for energy conservation, the industrial process heat requirement, will be frittered away through the lack of development or the use of conventional cogeneration technology unless the electric utility industry takes the leadership in developing and implementing AP&L type programs before these industries make the switch to coal-fired equipment."

Nuke construction ...

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face.

The 740-ton vessel was then walked 50 feet while being hoisted to a height of 110 feet, a first in nuclear power plant construction. Boomed out to the center of the reactor building, the RPV was lowered precisely on to 120 3-in.-diameter anchor bolts on its pedestal. The lowering of the vessel required maintenance of an 11-in. clearance between the RPV and the previously-installed shield wall which surrounds it.

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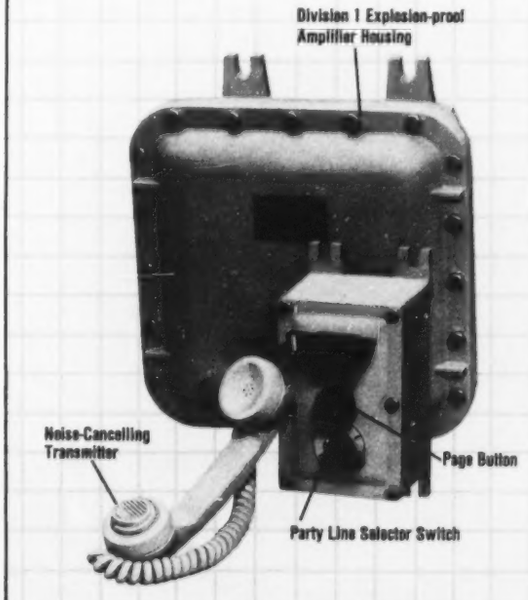

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